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Patent
Attorney's Docket No. 001560-387

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Patent Application of)
)
Keiko SAKAKIBARA et al) Group Art Unit: 1655
)
Application No.: 09/673,300) Examiner: Juliet Einsmann
)
Filed: October 16, 2000)
)
For: GENES ENCODING PROTEINS)
 HAVING ACTIVITY OF)
 TRANSFERRING SUGAR ONTO)
 AURONES)

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REPLY AND AMENDMENT

Assistant Commissioner for Patents
Washington, D.C. 20231

Sir:

In complete response to the Office Action mailed November 27, 2001, please
amend the above-identified application as follows.

IN THE CLAIMS

Kindly delete claims 7, 8, 11 and 12 without prejudice or disclaimer.

Kindly replace claims 1-4 and 9-10 as follows.

C1
1. (Amended) A gene encoding a protein having an activity of transferring a
glycosyl group to aurone, wherein said gene encodes an amino acid sequence having at
least 43% sequence homology with an amino acid sequence selected from SEQ ID NOs: 2,
8 and 10, excluding a gene of Labuatae.

2. (Amended) A gene encoding a protein that has an amino acid sequence as set forth in SEQ ID NO: 2, 8, or 10, and that has an activity of transferring a glycosyl group to auronos.

C₁
C₂
3. (Amended) A gene encoding a protein that has an amino acid sequence modified by the addition, deletion and/or substitution with other amino acids of one or a plurality of amino acids in the amino acid sequence as set forth in SEQ ID NO: 2, 8, or 10, and that has an activity of transferring a glycosyl group to auronos, excluding a gene of Labuatae.

4. (Amended) A gene encoding a protein that hybridizes to a complementary strand of a nucleic acid having a nucleotide sequence encoding an amino acid sequence as set forth in SEQ ID NO: 2, 8, or 10 or a portion thereof under a stringent condition of 5 x SSC, 0.1% SDS and 50°C, wherein said protein has an activity of transferring a glycosyl group to auronos, excluding a gene of Labuatae.

C₂
9. (Twice Amended) A plant into which a gene according to claim 1 has been introduced, and a progeny and a tissue thereof having the activity of transferring a glycosyl group to auronos.

C₃
10. (Amended) A cut flower of the plant according to claim 1, or a progeny thereof having the activity of transferring a glycosyl group to auronos.

Please add new claims 13-24 as follows:

--13. (New) A vector comprising a gene according to claim 2.

C4 14. (New) A host transformed with a vector according to claim 13.

15. (New) A plant into which a gene according to claim 2 has been introduced, and a progeny and a tissue thereof having the activity of transferring a glycosyl group to aurones.

16. (New) A cut flower of the plant according to claim 15, or a progeny thereof having the activity of transferring a glycosyl group to aurones.

17. (New) A vector comprising a gene according to claim 3.

18. (New) A host transformed with a vector according to claim 17.

19. (New) A plant into which a gene according to claim 3 has been introduced, and a progeny and a tissue thereof having the activity of transferring a glycosyl group to aurones.

20. (New) A cut flower of the plant according to claim 19, or a progeny thereof having the activity of transferring a glycosyl group to aurones.

21. (New) A vector comprising a gene according to claim 4.

22. (New) A host transformed with a vector according to claim 21.

Cy
cont

23. (New) A plant into which a gene according to claim 4 has been introduced, and a progeny and a tissue thereof having the activity of transferring a glycosyl group to aurones.

24. (New) A cut flower of the plant according to claim 23, or a progeny thereof having the activity of transferring a glycosyl group to aurones.--

REMARKS

Entry of the foregoing, reexamination and reconsideration of the above-identified application are respectfully requested.

Claims 1-4 and 9-10 have been amended. Claims 7, 8, 11 and 12 have been deleted without prejudice or disclaimer of the subject matter set forth therein. Applicants reserve the right to file a divisional application directed to such claims.

Claim 1 has been amended to further define the claimed gene, by further defining the protein it encodes. Claims 2-4 have been amended to be independent claims. New claims 14-24 have been added directed to preferred embodiments of the invention. These claims are substantially identical to claims 5, 6, 9 and 10, but depend from claims 2-4, as amended. No new matter has thus been added.

Applicants note the comment that the references from the international search report have been reviewed but have not been made of record for this application, and that a "proper IDS must be submitted." Applicants note that an IDS was submitted on October 16, 2000, which made the references cited in the International Search Report of record in this application. A copy of the IDS is submitted herewith. Applicants request that an Examiner initialed copy of the PTO 1449 be returned to the undersigned.

Claims 4, 9 and 10 have been rejected under 35 U.S.C. §112, second paragraph, as allegedly being indefinite. This rejection is respectfully traversed.

Claim 4 is said to be indefinite due to the recitation of "under a stringent condition." Stringent hybridization washing conditions, as disclosed by applicants, are 2 x SSC, 0.1% SDS and 50°C. *See*, page 7, lines 22-25. These conditions are now recited in

claim 4. Since these conditions were implicit in the recitation of “stringent” conditions, this is not a narrowing amendment.

Claims 9 and 10 are allegedly indefinite due to the recitation of “having the same property.” The “property” being referenced is allegedly unclear. It is believed to be clear within the construct of the claims that the property being referenced is “having an activity of transferring a glycosyl group to aurones.” The claims have been amended to recite this specific property. Since it was believed to be clear that this was the property originally referenced in the claims, this is not a narrowing amendment. *See*, page 4, lines. 20-26.

With respect to the recitation of “a progeny and a tissue thereof” in claim 9, it is believed to be clear that this refers to a progeny of the plant and a tissue of the plant. Claim 9 is directed to a “plant.” The “thereof” must refer back to that plant and thus the progeny are of the plant and the tissue are also of the plant. This is believed to be clear to a person skilled in the art from the claim.

Antecedent basis is allegedly lacking in claim 10 for the recitation of “having the same property as said plant.” Antecedent basis is believed to exist in the claim as now written in accordance with this amendment. Claim 10 now recites the same activity as recited in claim 1. Antecedent basis thus exists.

Withdrawal of the rejection under §112(2) is respectfully requested. Such action is believed to be in order.

Claims 1-6, 9 and 10 have also been rejected under 35 U.S.C. §112, first paragraph, as allegedly not being described in the specification. This rejection is respectfully traversed.

This rejection no longer applies to the claims of record. Claims 1-4 have been amended. These claims of record now encompass a gene encoding a protein having the ability to transfer a glycosyl group to an aurone. These claims now all require that the claimed amino acid sequence (1) is at least 43% homologous with that of SEQ ID Nos: 2, 8 or 10, (2) is encoded by a protein that has an amino acid sequence modified by the addition, deletion and/or substitution with other amino acids of one or a plurality of amino acids in the amino acid sequence as set forth in SEQ ID NO: 2, 8, or 10, (3) has the amino acid sequence of SEQ ID NO: 2, 8 or 10, and (4) hybridizes to the complementary strand of a nucleic acid encoding an amino acid sequence as set forth in SEQ ID NO: 2, 8, or 10 or a portion thereof under a stringent condition of 5 x SSC, 0.1% SDS and 50°C. The claimed claims all have the activity of transferring a glycosyl group to aurones. A gene of Labiatae is also specifically excluded from the claims.

These claims as now written were fully described in the specification as filed. One skilled in the art would recognize that applicants invented the genes as claimed. The amino acid sequences of SEQ ID NOS: 8 and 10 have about 43% homology. One skilled in the art would thus recognize that applicants' invention encompasses a gene encoding a protein, wherein said gene encodes an amino acid sequence having at least that 43% homology. One skilled in the art would further recognize that sequences having this homology, such as SEQ ID NOS: 8 and 10, have the same activity of transferring a glycosyl group to aurone.

With respect to claim 2, this claim is directed to a gene encoding a protein having the specific amino acid sequences SEQ ID NOS: 2, 8 and 10. This claim is fully described in the specification.

Claim 3 recites that the gene encodes a protein having a modified amino acid sequence of SEQ ID Nos: 2, 8 or 10, and that the protein has the activity of transferring a glycosyl group to auronos. This embodiment is described in the application at page 5, lines 2-8.

Claim 4 recites that the gene encodes a protein that hybridizes to a complementary strand of a nucleic acid having a nucleotide sequence encoding an amino acid sequence as set forth in SEQ ID NO: 2, 8, or 10 or a portion thereof under a stringent condition of 5 x SSC, 0.1 % SDS and 50°C, wherein said protein has an activity of transferring a glycosyl group to auronos. Such genes as claimed are described in the specification, for example, at page 7, line 11 - page 8, line 1. As stated in the specification:

Once a gene encoding a protein having the enzymatic activity has been cloned, the nucleic acid that hybridizes to said gene or a portion thereof encodes, in most cases, an amino acid sequence that exhibits the enzymatic activity and that is similar to the original protein. Thus the present invention provides a gene that hybridizes to a nucleic acid having a nucleotide sequence encoding an amino acid sequence as set forth in SEQ ID NO: 2, 8, or 10 or a portion thereof under a stringent condition, and that encodes a protein having an activity of transferring a glycosyl group to auronos. Page 7, lines 11-21.

One skilled in the art would thus recognize that applicants were in possession of the invention as recited in claim 4.

One skilled in the art would recognize and could readily obtain additional polynucleotides as encompassed by these claims. One skilled in the art would recognize that such polynucleotides are described in the application and were in applicants' possession at the time the application was originally filed.

Withdrawal of this rejection is respectfully requested. Such action is believed to be in order.

Claims 1-6, 9 and 10 have also been rejected under 35 U.S.C. §112, first paragraph, as allegedly not being enabled by the specification. This rejection is respectfully traversed.

The claims as written are fully enabled by the specification. Contrary to the assertion in the Official Action, one skilled in the art would be enabled to make and use the genes encompassed by the claims. One skilled in the art could readily obtain the genes as claimed, by looking at the sequence homology, by modifying the sequences or by hybridization of sequences. Such processes are described in the specification at, for example, page 6, line 5 - page 8, line 1.

One skilled in the art could then readily test the sequences thus obtained to determine whether the proteins encoded therefrom have the required activity of transferring a glycosyl group to auronos. The specification describes, for example, determining whether a gene has the activity of transferring a glycosyl group to auronos in Example 1, page 9, line 34 - page 13, line 35.

Simply because some experimentation is required does not mean that the claims are not enabled. A considerable amount of experimentation is permissible if it is merely routine or if the specification provides a reasonable amount of guidance regarding how to proceed to practice the invention. *Ex Parte Forman*, 230 USPQ 546, 547 (PBAI 1986). Both of these requirements are met for the instant invention. The claimed invention is thus fully enabled.

Withdrawal of this rejection is respectfully requested. Such action is believed to be in order.

Claims 1, 3 and 4 have been rejected under 35 U.S.C. §102(b) as allegedly being anticipated by the 1997 meeting of the Japanese Society of Plant Cell and Molecular Biology, as described in the specification. This rejection is believed to be rendered moot by the instant amendment.

According to the Examiner, the UFGT1 polynucleotide disclosed at the meeting inherently encodes a polypeptide having the glycosyl transferring activity, even if this activity was not appreciated. The polynucleotide disclosed at the meeting is now specifically excluded from the claims by excluding a gene of Labuatae origin.

Nor would the claimed genes have been obvious based upon the UFGT1 polynucleotide. As stated in the specification, this gene was not recognized as having the activity of transferring a glycosyl group to aurone. The claimed genes having this activity thus would not have been obvious in view of the prior art.

Withdrawal of this rejection is respectfully requested. Such action is believed to be in order.

Claims 1, 3, 4, 5, 6 and 9 have been rejected under 35 U.S.C. §102(b) as allegedly being anticipated by Bowles et al. This rejection is respectfully traversed.

Bowles et al is said to teach the TWI1 gene which has 61.9% local similarity to SEQ ID NO: 1 over nucleotides 87-1594. The TWI1 gene is identified as a glycosyl transferase. However, there is no disclosure that the Bowles TWI1 gene has the claimed activity of transferring a glycosyl group to aurone.

The reference further fails to disclose or suggest a gene as now claimed. There is no teaching of a gene encoding an amino acid sequence (1) having at least 40% sequence

homology with SEQ ID NOS: 2, 8 or 10, (2) as set forth in SEQ ID NOS: 2, 8 or 10, (3) which is a modified sequence of SEQ ID NOS: 2, 8 or 10, or (4) that hybridizes to the complementary strand of SEQ ID NOS: 2, 8 or 10. In view of the fact that the cited reference fails to disclose or suggest the gene as now claimed, the rejection is thus rendered moot by the instant amendments.

Withdrawal of the rejection of record is respectfully requested. Such action is believed to be in order.

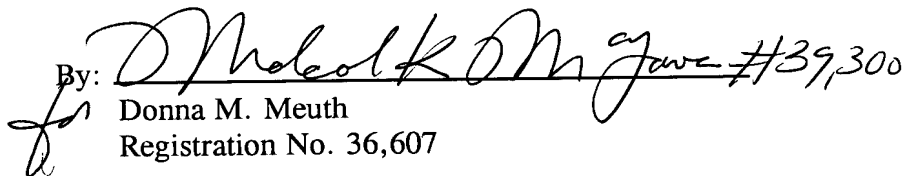
It is respectfully submitted that all rejections have been overcome by the above amendments. Thus, a Notice of Allowance is respectfully requested.

In the event that there are any questions relating to this amendment or the application in general, it would be appreciated if the Examiner would contact the undersigned attorney by telephone at (508) 339-3684 so that prosecution of the application may be expedited.

Respectfully submitted,

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